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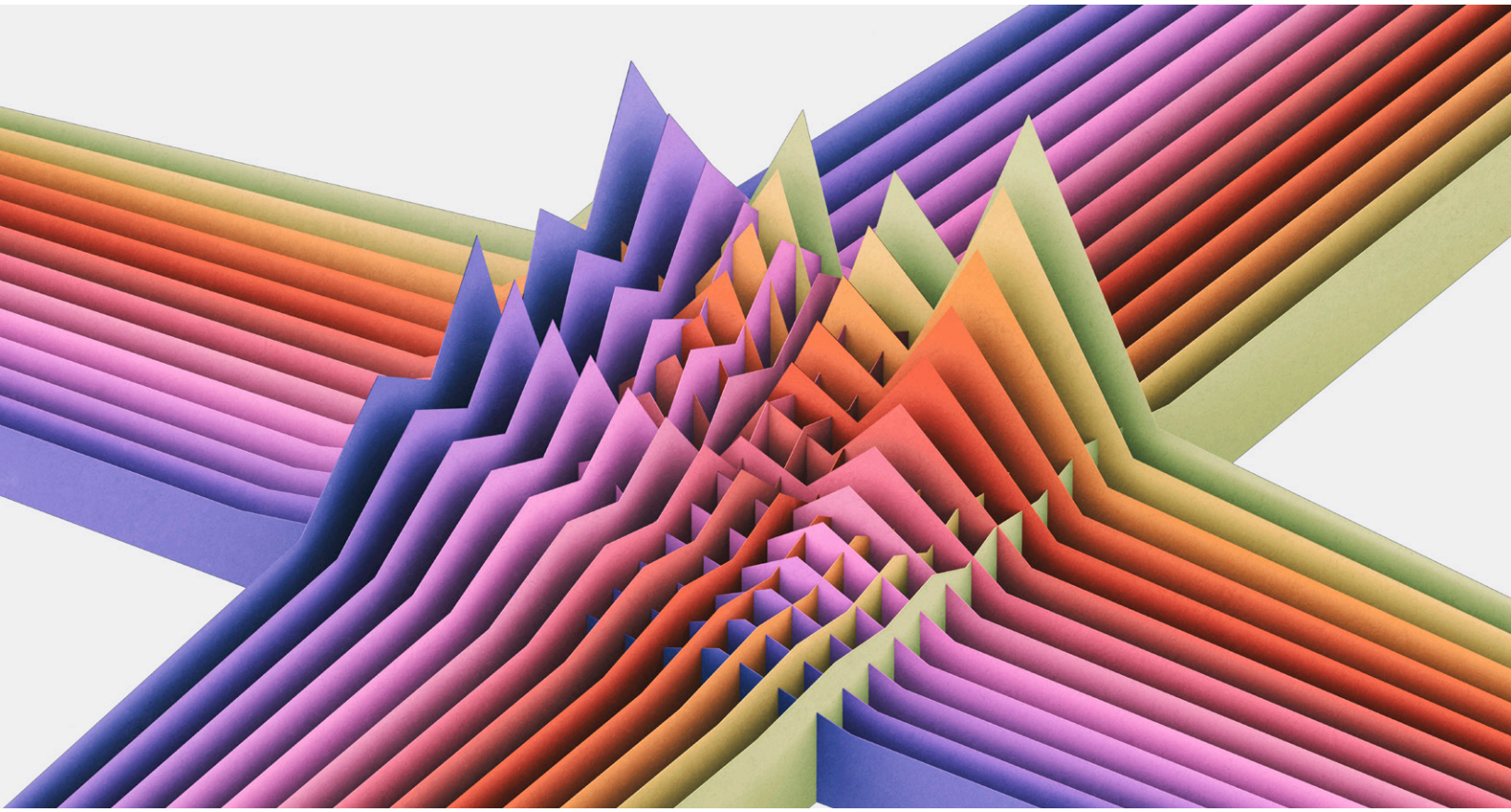
Risk and Strategy & Corporate Finance Practices

Are scenarios limiting your pandemic recovery strategy?

Parametric analysis can help finance chiefs expand their views of important variables for planning and decision making.

by Tim Koller, Aleksander Petrov, Yuri Polyakov, and Ishaan Seth



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Even as the COVID-19 crisis continues to loom, business leaders are launching planning and budgeting discussions to seek the next best strategic steps for their companies to take. For some—those in technology and pharmaceutical companies, for instance—the planning exercise has likely been relatively straightforward. These companies may have entered the crisis in good shape financially; some may have even experienced increased demand for their products and services during the pandemic. With their strong balance sheets and liquid positions, they have been able to convene plan-ahead teams to build forecasts, develop scenarios, and identify strategic moves and related key performance indicators.

By contrast, planning has likely been more complicated for companies that are still reacting to the immediate effects of the COVID-19 pandemic or for whom business uncertainty is not only an outgrowth of the current health and economic crises but also a natural state of play in their industries. Companies in electric power, natural gas, logistics, and manufacturing, for instance, must continually account for exogenous factors beyond their control—for example, credit spreads or the price of production inputs. Given the double-dose of uncertainty, these businesses may benefit from a multidimensional approach to scenario planning.

Right now, most of these businesses are limiting themselves to three or four macrolevel scenarios that describe the general direction of the economy but do not give business leaders enough of the detailed information they need to explore all the future paths possible within those scenarios. A more effective model is to build an "uncertainty cube" that allows business leaders to accurately assess the probability that certain outcomes will materialize under various scenarios.

The cube model and underlying analytics are similar to ones that finance leaders routinely use to calculate cost, cash flow, or value at risk. Under this expanded view, however, a few generic response or recovery scenarios can be translated into up to 10,000 data points that reflect all relevant financing variables over a two- to three-year period. A company can then use data from the cube model to enhance its financial planning and analysis (FP&A) models and evaluate all the possible actions that management can take—thereby allowing for unbiased critical investment and allocation decisions.

In our experience, expanding the number of scenarios is not that much more difficult or time-consuming than assessing the impact of only a handful, as long as business leaders take the time

Building an "uncertainty cube" allows business leaders to accurately assess the probability that certain outcomes will materialize under various scenarios.

Exhibit 1

In the wake of the COVID-19 pandemic, a manufacturing company explored three planning scenarios.

Projected cash position in the United States, $ million

	Company-specific implications
Quick recovery Rapid and effective control of the virus spread and partially effective interventions	Sales are down 60 percent for 3 months, recover over next 6 months; credit spreads normalize in 3 months; foreign exchange does not move materially
Moderate shock Effective public-health response, but regional virus resurgence and partially effective interventions	Sales are down 60 percent for 3 months, recover over next 9 months; credit spreads normalize in 6 months; foreign exchange does not move materially
Severe shock High levels of health impact; prolonged downturn	Sales are down 80 percent for 3 months, recover over the following year; credit spreads stay elevated for 12 months; foreign exchange moves adversely

to vet the initial financial variables they are plugging into those scenarios.

The power of the cube

As part of their planning and budgeting discussions in the wake of the COVID-19 pandemic, business leaders at one manufacturing company needed to make a decision: Should they raise additional cash, or take further cost-reduction measures to strengthen the balance sheet? The team reviewed three macro scenarios reflecting the effects of the COVID-19 crisis: the spread of the virus is contained and economic recovery is slow, the spread of the virus resurges and economic recovery is muted, and the spread of the virus escalates dramatically and economic recovery is slow (Exhibit 1).[1]

Business leaders identified the following six critical financial variables that would affect the company's P&L in any of these scenarios:

- US GDP
- appreciation or depreciation of European currencies
- appreciation or depreciation of Brazilian currency
- BBB-rated credit spreads
- steel prices
- oil prices

[1] Kevin Buehler, Arvind Govindarajan, Ezra Greenberg, Martin Hirt, Susan Lund, and Sven Smit, "Safeguarding our lives and our livelihoods: The imperative of our time," March 2020, McKinsey.com.

The manufacturing company homed in on these six factors, but the number and type of relevant financial variables will differ, of course, based on company and industry. Most companies have a taxonomy of financial risk; if not, finance leaders should work with business units to create one, ensuring that their perspectives are reflected in the selection of the most critical factors to model.

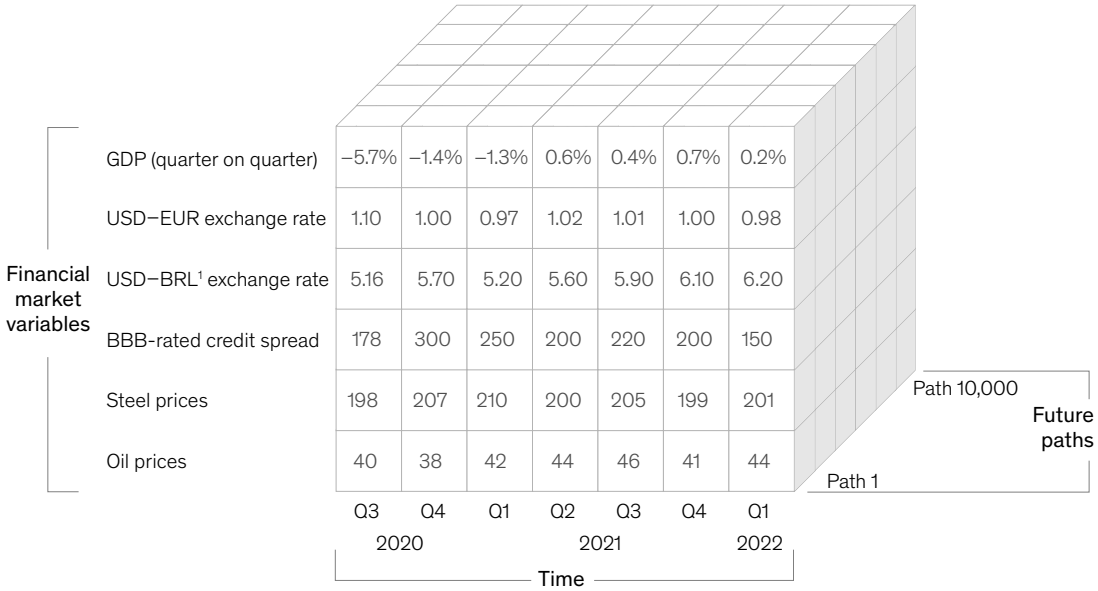
To represent three possible scenarios for each of these six variables across seven business quarters, the manufacturing company would have needed to examine more than 1,500 future paths—and yet that still may have not been enough information to properly capture the future uncertainty. The three base scenarios may reflect where the economy is going, broadly, but what about activity in the white spaces?

To answer this question, the manufacturing company built an uncertainty cube, which allowed it to expand its analysis and assess 10,000 future paths, thereby ensuring that the broadest possible range of outcomes associated with the relevant market variables would be accounted for. For instance, in one future path, a sharp drop in GDP in the fourth quarter of 2020 was accompanied by a dramatic rise in credit spreads and increasing steel prices, while on another future path, GDP similarly fell meaningfully but credit spreads remained constant and steel prices softened (Exhibit 2).

The company used the findings from this expanded analysis to adjust its FP&A models to be highly sensitive to movements in any of those six critical market areas. It was therefore in a better position to translate foreign revenues into home currency at simulated exchange rates, accurately reflect input costs with simulated steel prices, adjust sales volumes to be consistent with stochastic GDP, and shift funds to reflect corporate credit spreads.

Exhibit 2

The uncertainty cube lets leaders explore all possible outcomes associated with relevant financial variables.

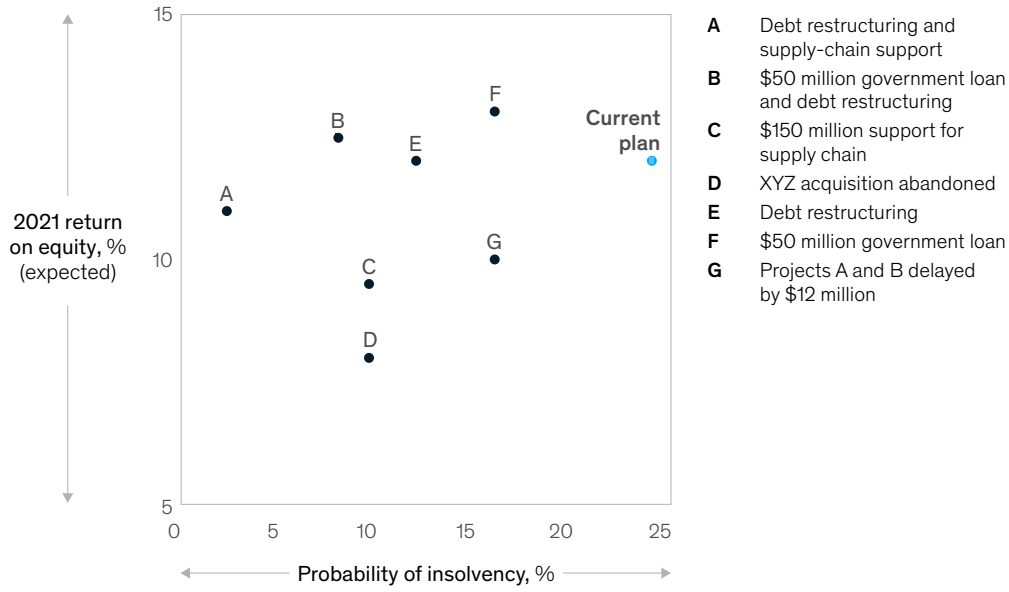


[1]Brazilian real.

Exhibit 3

A manufacturing company evaluated the expected return from various actions in response to the COVID-19 crisis.

Scenario evaluation matrix



Additionally, the company was able to evaluate each potential managerial action by calculating the expected return on equity— the average across all simulated scenarios—versus the probability of a particular risk event occurring.[2]

After analyzing all the data, business leaders were surprised to learn that the probability of insolvency was nearly 30 percent over the next 24 months, a result of the COVID-19 pandemic's effect on global currencies and oil prices. The findings highlighted the urgency for business leaders to take further actions to strengthen the balance sheet. They knew the possibilities could include applying for government help, restructuring existing debt or issuing new debt, issuing equity, pursuing an alternative financing structure, prioritizing capital expenditure programs, or canceling M&A transactions.

In general, the "right" action to take will depend on industry, capital structure, and company-specific factors. But armed with information from the uncertainty cube, business leaders can better evaluate which management and financing options to pursue individually or in combination—free of the biases that can creep into high-stakes decision making.

In the case of the manufacturing company, the FP&A team's models (using data from the uncertainty cube) revealed that applying for a government loan and restructuring bank debt would significantly reduce the probability of insolvency. Similarly, not proceeding with an acquisition would allow the company to reduce the probability of insolvency (by saving cash); however, it would also compromise future returns. The company saw that supply-chain disruption was the single biggest possible point of failure. Hence it chose, as an optimal path forward, to combine debt restructuring with an accelerated purchasing program aimed at supporting suppliers (Exhibit 3).

[2] This number can be determined by dividing the number of scenarios in which the risk event occurred by the total number of evaluated scenarios.

The logistics of the cube

As this example shows, the uncertainty cube promotes multidimensional thinking about a company's financial position. Particularly amid a crisis, it can help management teams find the balance between response and recovery strategies—between, say, reducing the probability of insolvency in the near term and compromising the company's future growth. And in those industries in which high risk is the norm, the cube allows business leaders to keep *all* time horizons in view when evaluating the effectiveness of proposed management actions.

Of course, not every business situation will warrant use of the uncertainty cube. To determine whether investing in expanded scenario analysis is warranted, a company should evaluate at least one deeply stressed future path. The FP&A team could, for instance, simultaneously carry out a stress test on a set of relevant market variables using their largest observed one-year moves and create a 12- to 24-month financial forecast based on these values. If this extreme stress test reveals that the company's balance sheet will remain strong, no further action would be necessary.

But if the stress test reveals weaknesses, the company may want to pursue an expanded review of future paths using the uncertainty cube. It is important to note that the incremental effort of evaluating management actions over thousands of future paths is not fundamentally different from that required to evaluate even a few scenarios properly. Additional work will be required, but the uncertainty cube can be embedded as a module within the FP&A tool kit (and owned by the FP&A team) and may be linked to a company's existing cash-flow models. Once the future paths are defined across relevant market variables and FP&A models are made sensitive to these variables, fully adopting the suggested methodology is a straightforward task.

In times of crises (and beyond), business leaders need to build financial plans that not only reflect and acknowledge the ever-present uncertainty but also position their companies as resilient organizations. The uncertainty cube and FP&A models that are adjusted based on data from the cube are critical tools for doing just that—anticipating a range of future paths for the company and identifying the right type and mix of actions leaders can take to effectively respond and recover from economic shocks.

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